Morgan’s Portfolio

徐梓晏 #HCI #UXDesign #ServiceDesign

Tzu-Yen Hsu Observe life, create better experiences

Morgan HSU TZU YEN

你好！ Hello! こんにちは～

EDUCATION

M.A. in Industrial Design
NTUST | GPA 4.2
- Full-ride Merit Scholarship (top-performing student)
- **HCI Research**: Sleep Airline — RtD deployment, ACM DIS 2026 submitted
- **Service Design**: PSA Charitable Foundation
- **Design Exchange Visit** — Politecnico di Milano, workshops & studio visits (2026 Spring)

B.A. in Industrial Design
NTUST | GPA 4.03
- Minor: Interaction Design
- - Leadership: President, Leadership Club

EXPERIENCE

2026
- **ACM DIS 2026 Poster Presenter, Singapore** For a separate HCI research project
- NTUST **Representative, Academic Visit** — Politecnico di Milano

2024
- **Finalist, MOE Design Elite Program** (Chiba University, Japan)
- Art Planning Lead, 8th Leadership Zen Camp (250+ pax)
- TA, 3D & UV Printing Lab

2023
- **Finalist, YODEX Industry-Academia Collaboration**
- Art & Admissions Director, NTUST Leadership Club

2022
- **1st Place, New Taipei ESG Youth Forum**
- 1st Place, NTUST Future Mobility Forum

2021
- 1st Place, NTUST Metaverse Youth Forum

EXPERTISE

Research
HCI · UX Research · User Interview · RtD

Design
Interaction Design · Service Design · HMI · UI/UX

Build
Figma · Raspberry Pi · Firebase · GenAI API · Cursor

2026 | NTUST Representative
Study Visit to Politecnico di Milano

2025 | Camp Commander
Led 40+ pax in Service Team

2024 | MOE Elite Finalist
Selected among national finalists

2022 | 1st Place Pitch
New Taipei ESG Youth Forum

About Me

HCI × Service Design × Health.

“I design because I want people to feel better.”

Who I am
I'm Morgan, an MS Design student at NTUST specializing in HCI and Service Design. I care deeply about people's wellbeing — and I believe thoughtful design can genuinely improve the quality of everyday life.

How I work
I move between research, systems thinking, and prototyping: mapping complex service ecosystems, translating insights into interaction logic, and building high-fidelity prototypes that make ideas testable.

What I design for
This portfolio explores how design can support people in vulnerable or demanding moments — falling asleep, staying focused while driving, and recovering after injury. Different contexts, different platforms, but the same belief: design can make difficult moments easier to understand and move through.

What shaped me
Workshops at Politecnico di Milano, the MOE Design Elite Program, and cross-disciplinary team experiences have shaped how I communicate across cultures, collaborate with others, and bring broader perspectives into local problems.

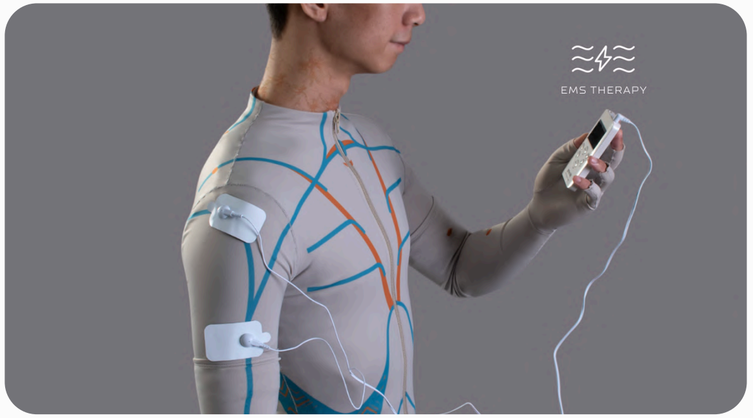
| PROJECT OVERVIEW |

01 **Sleep Airline** P5~12

Sleep Experience · RtD · HCI
Paper Submission

02 **SafeDrive Focus** P13~19

In-vehicle interface ·
Mercedes-Benz · HMI



03 **REFLY** P20~27

Health Rehabilitation,
E-Textiles, Service Design

SLEEP AIRLINE

Reimagining Sleep as an Interactive Narrative Journey

Reframing the sleep experience through flight metaphors to combat the anxiety of quantified sleep tracking.

HCI & UI/UX Design	Raspberry Pi + AI-Assisted Dev
Research through Design (RtD)	ACM DIS 2026 WIP Submitted
Solo Project	2025 Q4 – Present	Advisor: Yu-Ting Cheng

| **Background** | Sleep is a transition to be experienced, not just a routine.

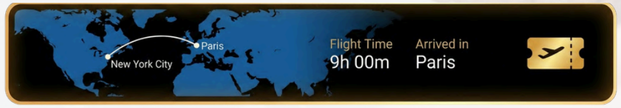
Problem Space

1 The Neglected Onset
Sleep science focuses on mid-sleep; the experiential potential of falling asleep remains unexplored (Lacaux et al., 2024).

2 Quantified Anxiety
Sleep tracking turns rest into a performance metric. Fixating on scores exacerbates anxiety, leading to "orthosomnia" (Baron et al., 2017).

3 The New HCI Route
While HCI shifts towards experience-centered design, narrative design for the "falling asleep" transition remains an unfilled gap (Wan et al., 2024).

Design Strategy



1 Redesigning the Ritual
Reframing the act of falling asleep into a "takeoff ritual," bringing meaning and anticipation to a neglected moment.

2 Distance over Duration
Translating sleep hours into flight distance (e.g., 9h = Paris). Waking up becomes a new story, not a test score.

3 Narrative over Data
Leveraging Data Fiction and GenAI to craft personalized flight journeys and captain announcements for every sleep session.

Design Solution

SLEEP AIRLINE

Falling asleep should be seen as a designed transition rather than a performance.

By turning sleep data into a narrative journey, we shift from tracking anxiety to the excitement of a new destination.

| **Design Metaphor** | 1 Sleep Session = 1 Flight (Hours × 900 km/h = Destination)

Normal Experience

Falling asleep
Abrupt transition to rest

During sleep
Unconscious time

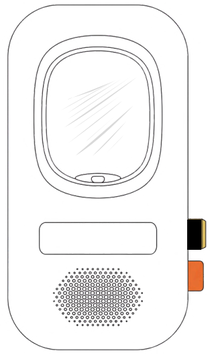
Waking Up
Sudden transition to wake

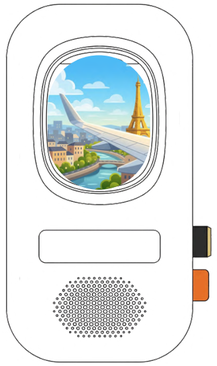
Sleep Airline

Takeoff Ritual
Button press & captain's broadcast

During cruise
Flying while deep in sleep

Landing Ritual
Arrival & GenAI captain's greeting





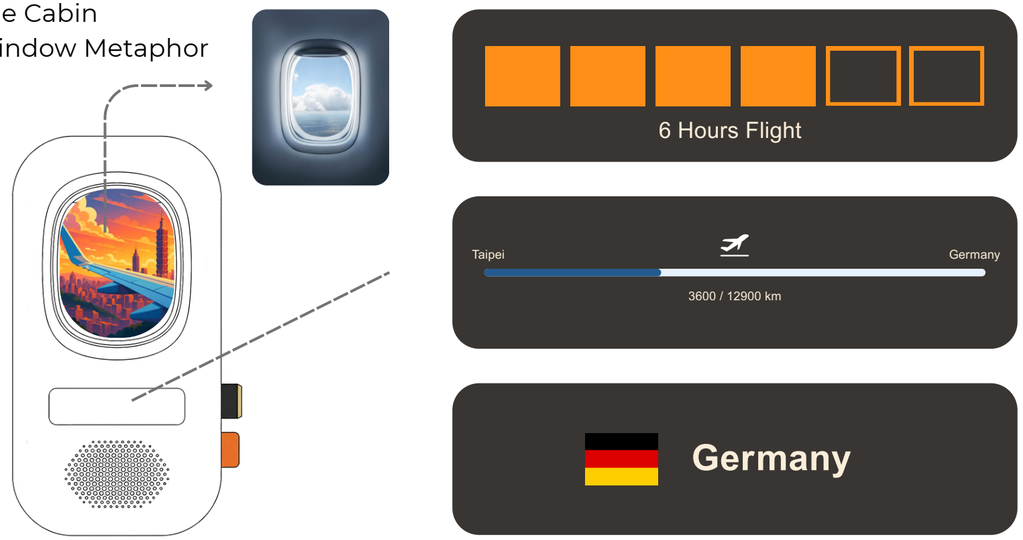
Set Journeys, Not Just Alarms
Turn knob to set hours. Replaces alarm anxiety with departure anticipation.

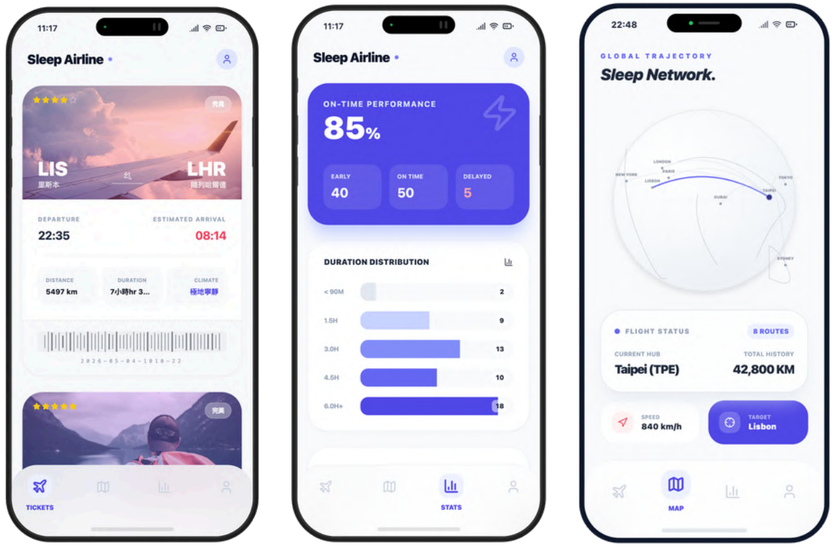
Minimal Tracking, Lower Anxiety
Tracks duration only, avoiding sleep-score pressure.

Stories Over Scores
Screen reveals destination. Wake up to a fresh journey, not a test grade.

| **UI Decision** | Adapting to User States

The Cabin
Window Metaphor





*vibe coding website

Device: Minimal Cognitive Load
Simplified for pre-sleep and post-wake grogginess:

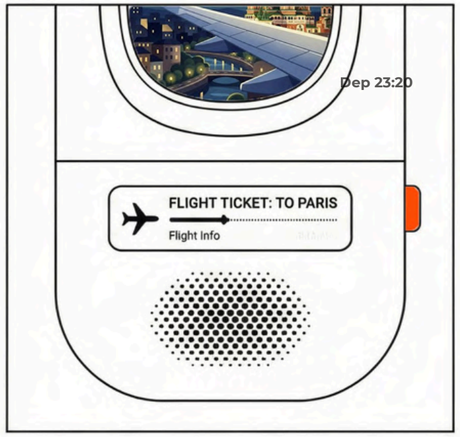
- **On-Demand Display**
  Lights up only for takeoff and landing; auto-dims during cruise.
- **Zero-Reading UI**
  Physical knobs and buttons only. No complex tapping required.
- **Visuals First**
  Flags and city illustrations replace raw numbers and charts.

Mobile App: Post-Wake Reflection
Detailed insights delivered only when fully awake:

- **Ticket Collection**
  Logs departure, destination, and GenAI-generated photo stories.
- **On-Time Performance**
  Replaces stress-inducing scores with aviation-style regularity stats.
- **Duration Trends**
  Long-term sleep tracking for proactive health management.

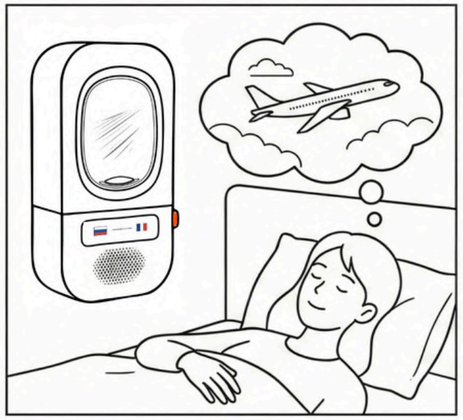
| **User Journey** | GenAI-Enriched Sleep Experience

1. SET DURATION
Hours = Flight distance



2. CONFIRM FLIGHT
Close shutter to sleep.

3. PREPARE TO SLEEP
Pull shutter to depart.



4. CRUISING
Narrative sleep journey.

5. LANDING
GenAI arrival story.

6. SYNC LOGS
Saved to mobile app.

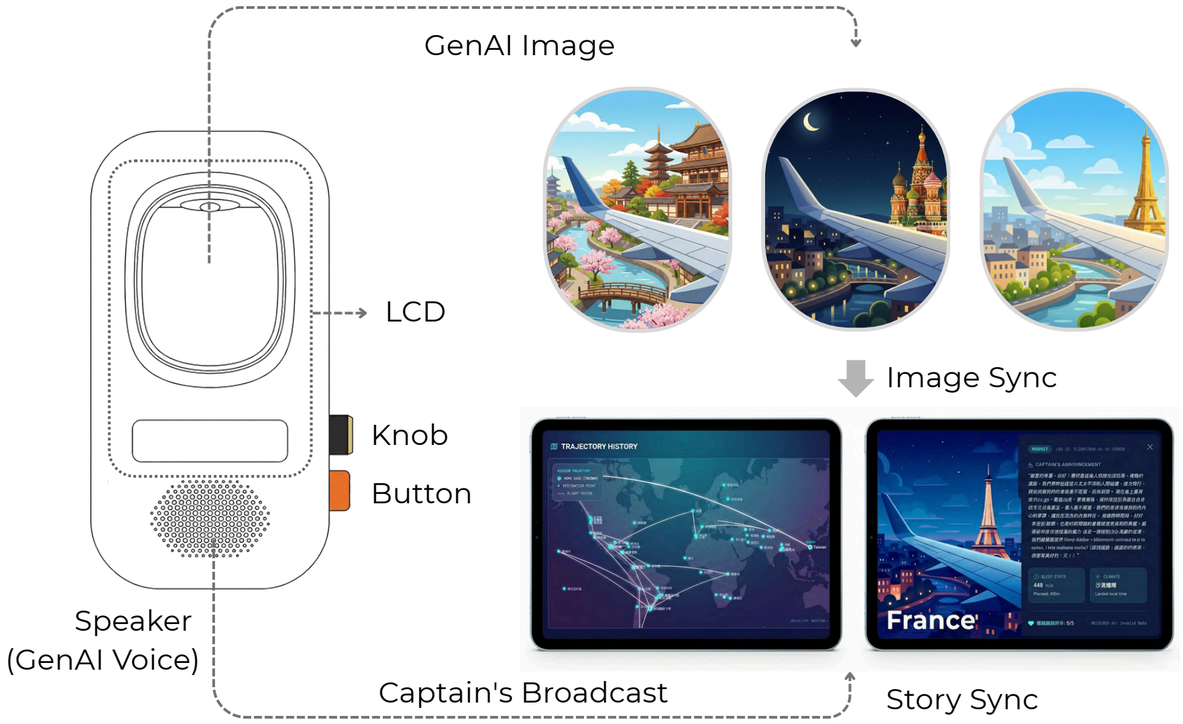
GenAI adapts the aviation narrative dynamically based on your actual wake-up time each morning.

WAKING UP EARLY
"Wormhole shortcut! Arrived ahead of schedule."

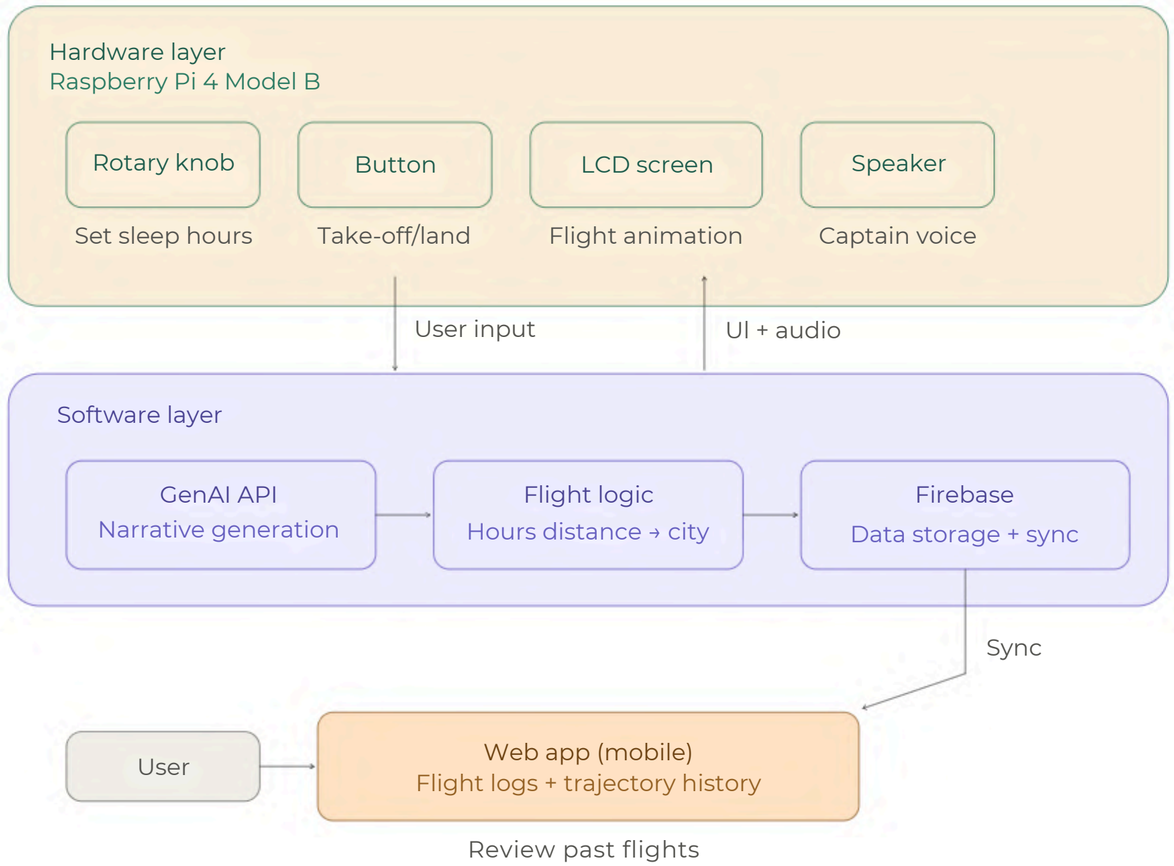
WAKING UP ON TIME
"Like a Swiss watch. Landing perfectly on time."

SLEEPING IN LATE
"Severe turbulence! Rerouting towards Türkiye."

| **System Integration** | Hardware-to-Cloud Architecture



System Architecture



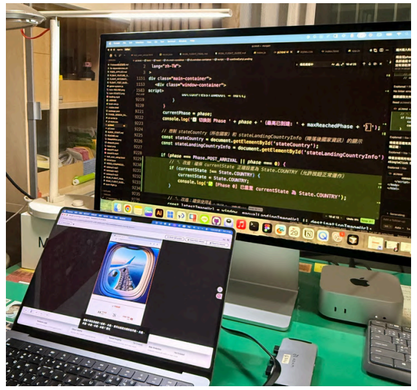
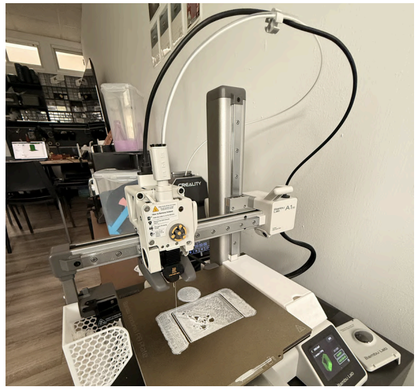
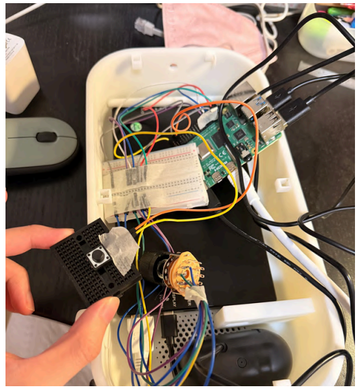
❶ Contextual Captain's Broadcast

Powered by OpenAI, it generates culturally tailored landing announcements based on sleep duration and destination (e.g., greeting a Parisian sunrise).

❷ First-Person Cityscape Generation

Creates unique destination visuals for every flight. The fixed airplane wing serves as a consistent visual anchor, making each journey immersive and unique.

| **Development & Testing** | AI-Assisted Dev & Initial Deployment

Dec 2025 | AI-Assisted Full-Stack Prototyping

Leveraged AI tools (Cursor) to independently build a deployable, high-fidelity Research through Design (RtD) prototype:

- Hardware: Raspberry Pi, manual soldering & sensor integration.
- Interface: Embedded UI with context-aware display logic.
- Backend: Firebase sync, GenAI API & Web App.



Jan 2026 | Exploratory Field Deployment (RtD)

Deployed the prototype in real-world contexts to uncover design insights through "learning by doing":

- In-Home Testing: 7-day in-home deployment with 3 selected users, using the prototype as their primary alarm.
- Data Triangulation: Qualitative insights via daily LINE logs, interviews, and review sessions.
- Thematic Analysis: Extracted cognitive shifts to drive V2 design iterations.

| **Results & Future Action** | Behavioral Shifts & Social Potential

Inviting — Anticipating the sleep journey

P1 Retired Officer
Reported natural drowsiness and yawning after the “takeoff ritual.”

P2 College Student
"I want to protect the plot" — automatically put down the phone and stopped scrolling.

Actionable — Proactive behavioral changes

P3 Night-shift Nurse
Calculated bedtime backwards to "reach the destination," going to bed earlier than before.

Shareable — Sleep as a social topic

P3 & Brother
Created shared journeys across time zones, using flight stories to discuss sleep habits.

V2: The Social Sleep Journey

Initial deployment suggested social potential, which informs the next iteration: shared flights, relays, and layover-style sleep connections. (Karlgren & McMillan, 2023).

- Evolution: Group flights, relays, and layover meetings.
- Goal: Foster healthy habits through social connection.

Project status: ACM DIS 2026 WIP submitted
Next step: TAI-CHI 2026 full paper target
Clinical Exploration: Consulting therapists & social workers.

SafeDrive Focus: Minimizing Distractions

Designing Attention Interventions for Future Smart Cockpits

A Conceptual HMI Redesign for Premium In-Vehicle Systems

(Mercedes-Benz GLC context)

UX Research | HMI Design | Usability Evaluation
Team of 4 | My Role: User Research, Problem Definition, Interaction Logic & Testing

PROBLEM & OPPORTUNITY | THE HIDDEN DANGER OF LARGE IN-VEHICLE SCREENS

As in-car panels grow larger, the rise of **Non-Driving-Related Tasks (NDRT)** creates critical safety risks. Our mission is to mitigate these distractions without compromising the vehicle's luxury experience.

A. Kashevnik、R. Shchedrin、C. Kaiser and A. Stocker (2021) Zangi, N.、Srour-Zreik, R.、Ridel, D.、Chassidim, H. and Borowsky, A. (2022)。

Mercedes-Benz GLC 2024

Trend of Large In-Car Panels

Increase in NDRT

Visual Distraction

Cognitive interference

Manual distraction

The Design Goal:

Reduce driver cognitive load by introducing Dynamic HMI Reconstruction.

The Design Constraint (GLC Case):

Strike a balance between optimizing safety and preserving the brand's luxury feel.

HMW: How might we streamline the in-car interface to boost operational efficiency while maximizing driver focus on the road?

Pain Points & Interview Quotes

User Insights (N=4 Active Drivers)

1. Disconnect: Architecture vs. Real Needs

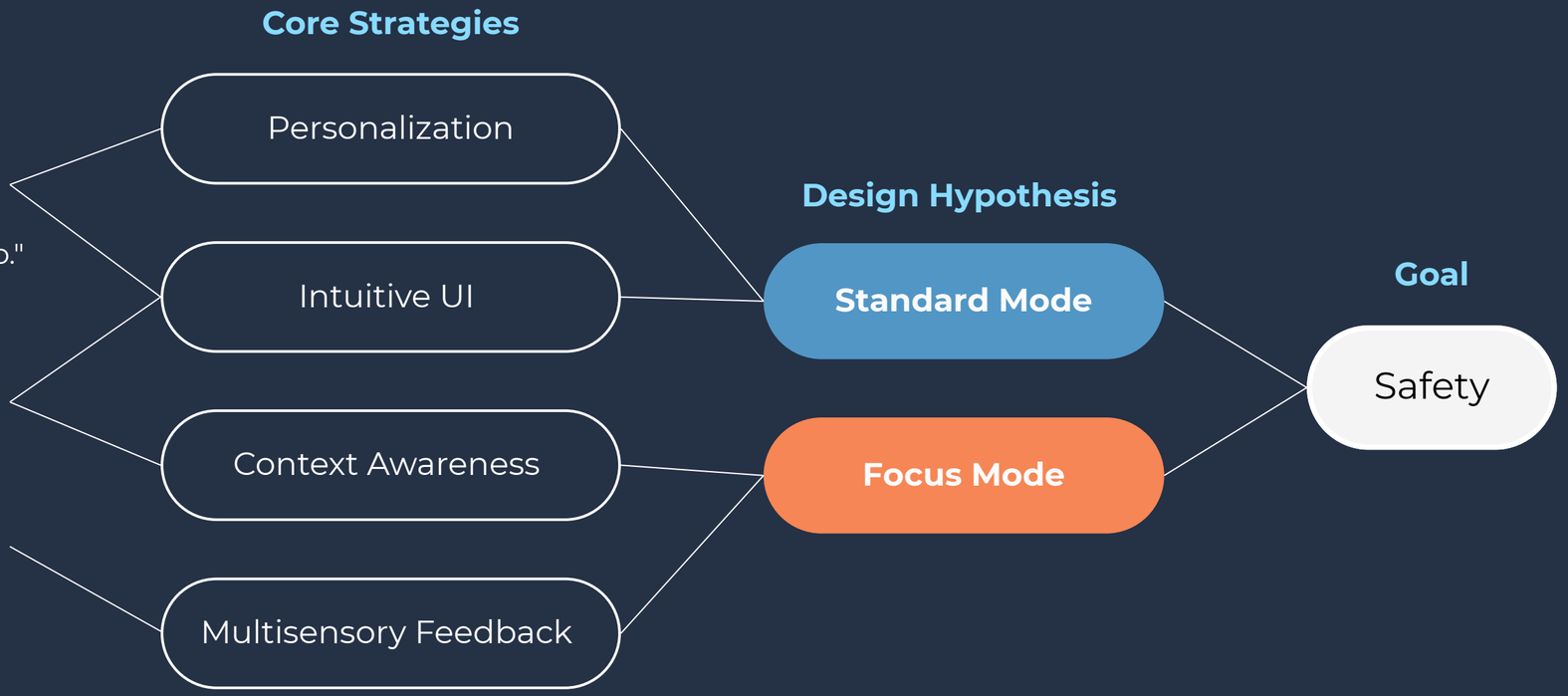
"I have to click extra times for music, while the home screen shows radio stations I never listen to."

2. Complexity: Information Overload

"Features are buried too deep; I don't dare look away to explore them while driving."

3. Uncertainty: Lack of Clear Feedback

"I tap the screen but get no response, forcing me to look down to confirm."



STANDARD MODE | TRANSLATING DRIVER CONTEXT INTO SEAMLESS INTERACTIONS

Anticipating needs through data, achieving a zero-layer experience.

Standard Mode

Core Principles

 # DataDriven
 # ZeroLayer
 # AdaptiveUI

	Identity-Driven Personalization	Context-Aware Zero-Click	Task-Adaptive Layout
			
Scenario	Pre-loads the "Commute Home" mode via intelligent Face ID tracking.	Auto-expands the navigation map & proactively prompts family contacts.	Dynamically resizes the map layout to seamlessly fit media panels.
UX Value	Elevates biometrics to a smart trigger, beyond just a basic unlock.	Delivers zero-click navigation to reduce driver cognitive load.	Enables safe driving multitasking with completely unobstructed views.

FOCUS MODE | MINIMIZING COGNITIVE LOAD FOR MAXIMUM SAFETY

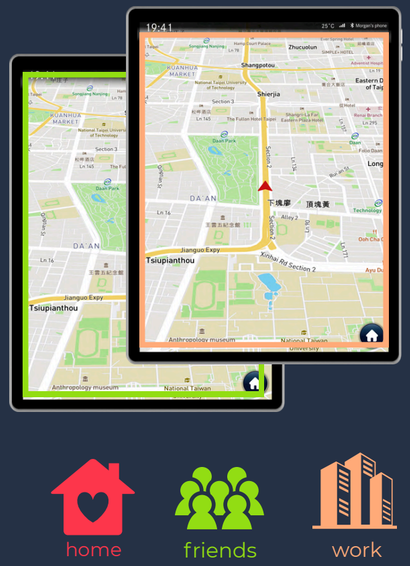
Proactively filtering distractions through context-aware interventions.

Focus Mode

Core Principles

 # ContextAware
 # LowDistraction
 # MultiModal

	Context-Aware Trigger	Smart Notification Filtering	Ambient Visual Feedback
Scenario	Auto-triggers Focus Mode when detecting heavy rain, tunnels, or gaze deviation.	Intercepts low-priority alerts and routes urgent messages to voice commands.	Replaces screen pop-ups with ambient light cues (e.g., orange for family calls).
UX Value	Shifts from manual toggles to a proactive safety mechanism based on cognitive load.	Actively filters distractions to ensure hands and eyes remain on the road.	Transfers visual load to the spatial environment for a low-distraction ride.



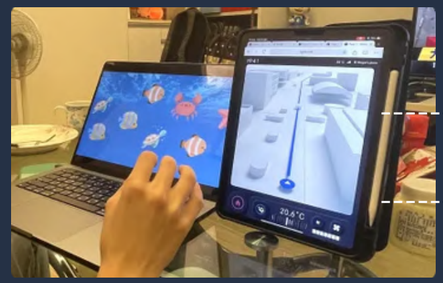
VALIDATION & INSIGHTS | COGNITIVE LOAD SHAPES DESIGN VALUE

Context shapes usability: what helps in relaxed driving may distract under stress.

Methodology: Gamified Dual-Task Test

Test Setup:

- Control (N=10): HMI operation only.
- Stress (N=10): HMI operation + Continuous attention game to simulate real-world driving focus.



---------- 🎮 Cognitive Stressor (Attention Game)

---------- 📱 HMI Prototype

🌿 Normal Driving - Low Cognitive Load

Users have ample cognitive capacity.

Standard Mode NPS Score 83.5

Focus Mode NPS Score 62.0

Rich info feels thoughtful; limited features create a sense of deprivation.

⛈️ High-Stress Driving (High Cognitive Load)

Cognitive resources are severely depleted.

Standard Mode NPS Score: 54.5

Focus Mode NPS Score: 86.5

Rich info becomes visual noise; proactive filtering is essential for usability.

Key Insight: **Rich UI was preferred in relaxed driving, but became distracting under stress. These results suggest that adaptive switching can better support safety-critical interaction.**

DESIGN REFLECTION & OUTLOOK | THE CORE VALUE OF ADAPTIVE HMI

There may be no “one-size-fits-all” interface for driving contexts. This concept explores how sensing cognitive load could help the system balance richness and simplicity, keeping information closer to the driver’s current needs.

Standard Mode — **Seamless switching** — **Focus Mode**

Low cognitive load, daily cruising
NPS 83.5

Simulated high-load condition
NPS 86.5

Future Outlook

Sensory Layer

Multidimensional Sensing

Eye-tracking for real-time distraction, lightweight EEG for fatigue, and steering grip pressure. Evolving into multi-dimensional cognitive modeling.

Interaction Layer

Zero-Touch Interaction

Replacing touch with LLM-powered voice and gesture controls. Supporting navigation and media control with fewer touch interactions.

System Layer

Cross-Vehicle Roaming

Tying identity to cloud profiles via Face ID to load personalized layouts. "The car may be rented, but the experience is exclusively yours."

REFLY

BURN REHABILITATION WEARABLE SYSTEM

Integrating E-textiles with mobile UI to translate physical therapy into visual feedback. Enabling real-time posture tracking for at-home rehabilitation to empower burn survivors' recovery.

Team: 2 Members
Scope: UX Research | System Design | App UI/UX
My Role:
User Interviews, UX Research, Interaction Design, App UI

DISCOVERY | THE GRUELING REALITY OF BURN REHABILITATION

The Rehabilitation Journey

11M Global Annual Burn Cases

70% Require Long-Term Rehab

(2-3 Weeks) (Weeks to Months)

"A crucial yet agonizing window: Ineffective rehab may limit long-term mobility."

Acute Care | Surgical Phase | **Post-Discharge Rehab (1-2 Years+)**

Rehabilitation is the longest and most challenging phase post-discharge, serving as the critical golden period for reclaiming daily life.

DISCOVERY | THE DUAL-SIDED BOTTLENECK IN REHABILITATION

The rehabilitation crisis stems from a systemic gap: patients struggle with execution at home, while understaffed clinics cannot provide adequate tracking and feedback.

Sunshine Social Welfare Foundation (2024.09)

Patient Perspective | Burn Survivor

"For us, discharge is just the beginning of the battle...."

1. Self-Correction Difficulty
"I never know if my posture is actually correct."
Lack of objective guidance at home leads to ineffective execution.

2. Accessibility & Compliance
"Commuting is exhausting, and the garments feel like endless torture.
Long commutes and physical discomfort wear down daily motivation.

Sunshine Foundation Rehabilitation Center (2024.09)

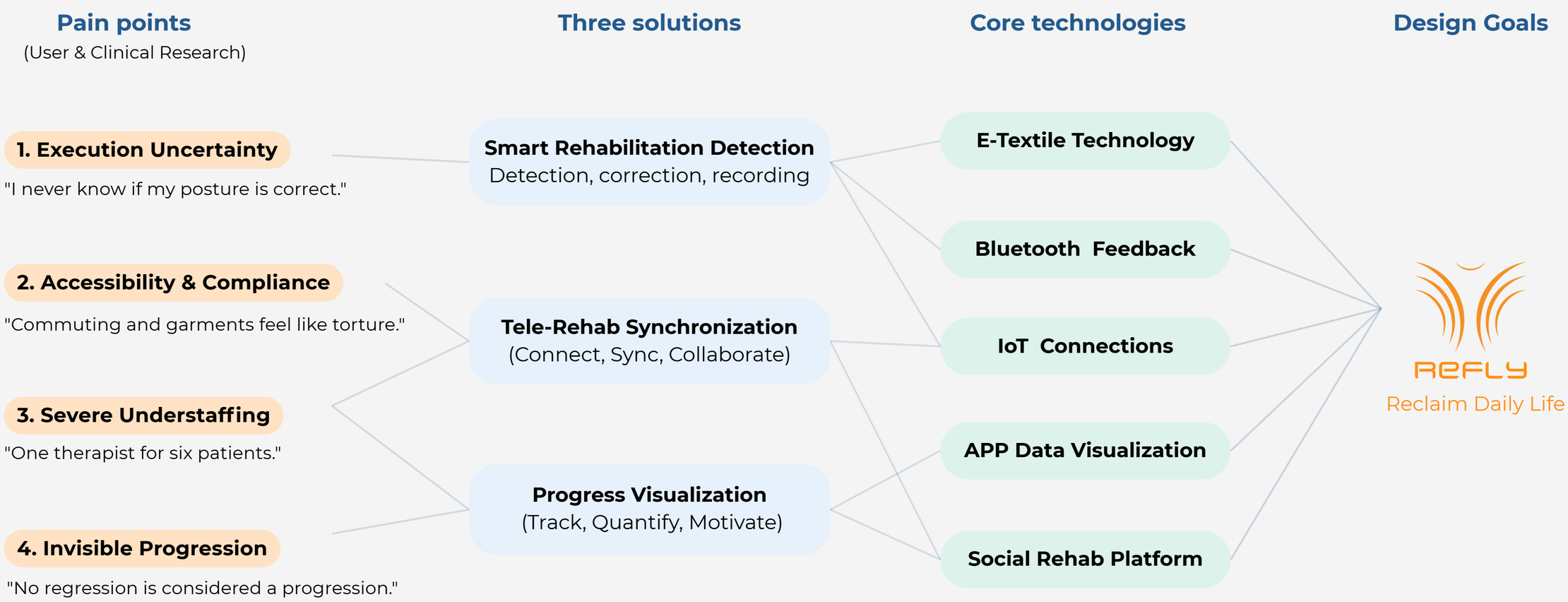
Clinical Perspective | Lead Physical Therapist

"In this field, no regression is considered a progression."

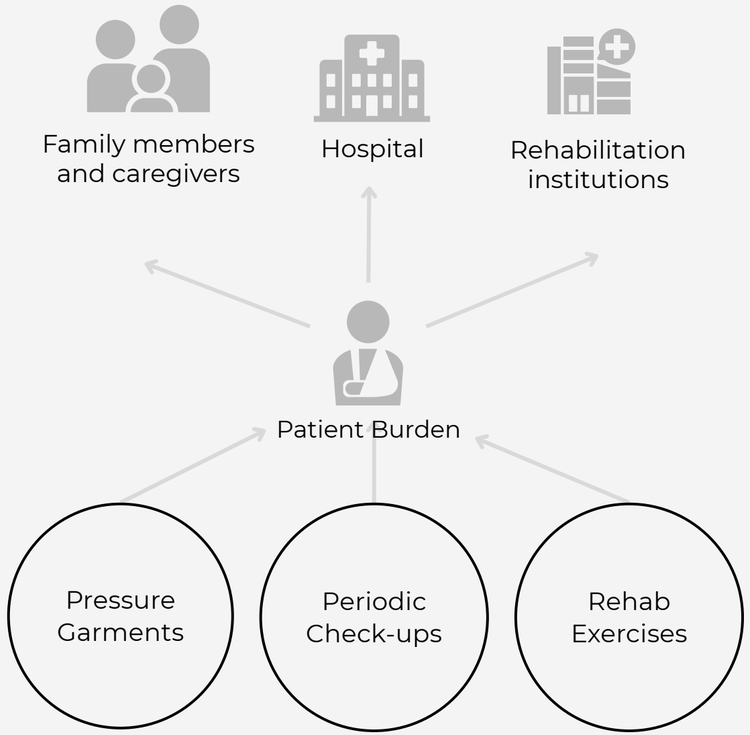
3. Severe Understaffing
"One therapist has to take care of six patients simultaneously."
Limited clinical resources compress sessions to 15 minutes.

4. Invisible Progression
"Without objective data, patients quickly lose motivation."
Severe communication gaps between the hospital and home care**.**

SYSTEM DESIGN | MAPPING SOLUTIONS TO DUAL-SIDED BOTTLENECKS



SERVICE DESIGN | SHIFTING FROM FRAGMENTED CARE TO AN INTEGRATED ECOSYSTEM

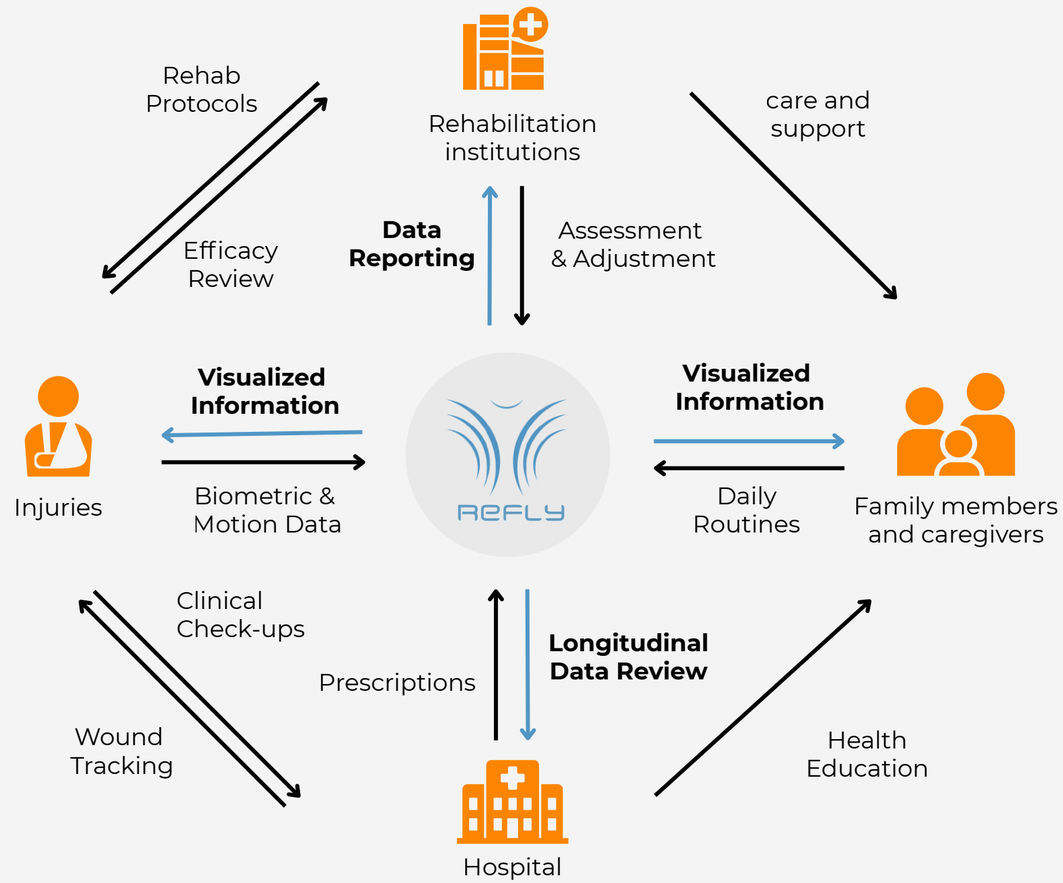


Current Fragmented Care

The patient bears the sole burden of managing fragmented treatments and communicating with isolated stakeholders.

REFLY

Integrated Service Network



Connected Ecosystem

A proposed centralized hub where rehab data can be shared across patients, caregivers, and clinics to support more timely feedback.

PRODUCT ECOSYSTEM | SEAMLESS HARDWARE & SOFTWARE INTEGRATION

1. E-Textile Garment

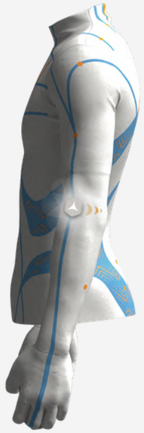
- Posture tracking
- Intuitive wearing
- Micro-current support

2. Bluetooth Core

- Posture data logging
- Magnetic attachment
- LED status indicators

3. REFLY App

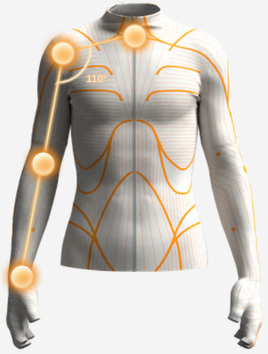
- Progress visualization
- Social rehab sync
- Action history tracking



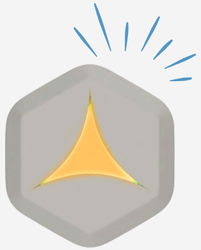
White LED indicates successful pairing.

App displays real-time battery & connection.

Interaction 01 | Seamless Pairing



E-textile detects posture deviations.



Controller vibrates for haptic alert.

App UI reflects dynamic corrections instantly.

Interaction 02 | Real-Time Correction

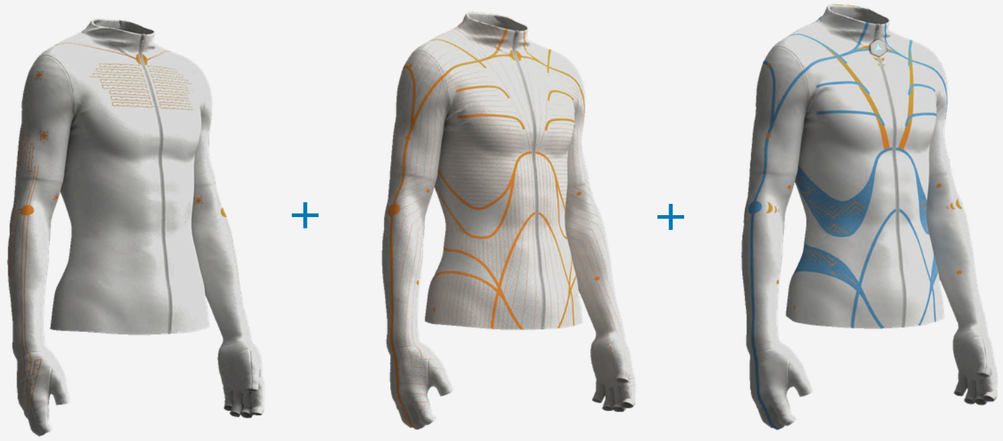
PRODUCT DEVELOPMENT | SMART TEXTILE ARCHITECTURE & PROTOTYPING

3-Layer Smart Textile Architecture

Printed Circuit Layer (Therapy)

Flexible Circuit Layer (Sensing)

Alignment Layer (Usability)



Detachable Bluetooth Module
Omnidirectional magnetic attachment designed for patients with limited manual dexterity, aiming to support easier and more accessible daily use.

Printed E-Textiles
Seamlessly integrating micro-electronics into fabric. The circuitry maps human anatomical lines for passive posture sensing and proposed micro-current support layer.

Moisture-Responsive Fabric (AquaBreath®)
A complementary material for burn patients, intended to reduce irritation on sensitive skin while supporting heat and sweat dissipation in intact areas.

Physical Realization & Wearability

UI/UX STRATEGY | REDUCE FRICTION, DRIVE MOTIVATION, CONNECT CARE

01 | Reduce Cognitive Load
Let patients focus on the movement itself.

Screen 1: Replaces stressful countdowns with achievable completion ratios.

Screen 2: Real-time 3D mirroring acts as the therapist's eyes for intuitive correction.

02 | Build Rehab Motivation
Transform lonely tasks into accompanied routines.

Screen 3: Remote co-practice reduces the pressure of appearing in public.

Screen 4: Reinforces a sense of achievement to encourage continued practice.

03 | Proactive Safety Protection
System intervenes before potential risk occurs.

Screen 5: Auto-pauses and triggers breathing guides upon detecting abnormal heart rates.

Screen 6: Connects patients, families, and clinics through progress data.

1. Task-Oriented Progress

2. 3D Posture Visualization

3. Social Co-Practice

4. Positive Reinforcement

5. Biometric Intervention

6. Transparent Data Sync

PROJECT REFLECTION | THE MEDIUM EVOLVES, THE HUMAN REMAINS

Reflecting on these projects, the essence of HCI lies not in the technology itself, but in designing interactions that respond to users' changing physical and cognitive states.

01 | Sleep Airline

Sleep Experience · RtD · HCI Publication

Platform:
Embedded bedside device & APP

Intervention time
Transitions between sleep and wakefulness

Design Strategy
Narrative metaphor over data anxiety

02 | SafeDrive Focus

Automotive UI · Premium IVI · HMI

Platform:
In-Vehicle Infotainment (IVI) & HMI

Intervention time
Moments of cognitive load fluctuation

Design Strategy
Dual-track adaptive UI switching

03 | REFLY

Digital Health · E-Textile · UI/UX System Design

Platform:
Wearable E-textiles + APP

Intervention time
Prolonged post-discharge rehab phase

Design Strategy
Sense-Feedback-Correct closed loop

Beyond the interface, my core philosophy is rooted in human nature:

Combining systematic thinking with deep observation and empathy to truly understand the people I design for

Observe life, create
better experiences

Tzu-Yen Hsu

Morgan’s Portfolio